PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS & INTERFERENCES

First Named Inventor: James Kevin Gillie

Serial No: 10/803,360 Group Art Unit: 1711

Filed: March 18, 2004 Examiner: Thao T. Tran

Att. Docket No.: A1019/20354 Confirmation No.: 5836

For: URETHANE BASED COATING APPLIED IN-LINE FOR IMPROVED INK ADHESION

APPEAL BRIEF UNDER 37 CFR § 1.192

Mail Stop Appeal Brief -- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

A Notice of Panel Decision from Pre-Appeal Brief Review was mailed from the United States Patent and Trademark Office on May 25, 2006, stating that this application remains under appeal.

A Petition for a Three-Month Extension of Time up to and including September 25, 2006, is enclosed.

REAL PARTY INTEREST

The Real Party of Interest is Applied Extrusion Technologies, Inc.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF CLAIMS

Claim 1, as amended in the Amendment mailed to the United States Patent and Trademark Office on September 13, 2005, and claims 2-24, as originally filed, remain pending in this application and are the claims being appealed herein.

Claims 25-48 have been withdrawn from consideration as being directed to a non-elected invention.

STATUS OF AMENDMENT

A Response to the Final Office Action was mailed to the Patent and Trademark Office on January 9, 2006. That Response presented only arguments in support of patentability and did not include any amendments to the claims. The Advisory Action Before the Filing of Appeal Brief was mailed from the United States Patent and Trademark Office on February 3, 2006, and does not state whether the Response filed by Applicant After Final Rejection was entered. The relevant arguments supporting patentability of the claims under appeal will be presented in this Appeal Brief.

SUMMARY OF INVENTION

This invention is directed to a printable, coated, biaxially oriented film including a polymeric base film in which the predominant polymer is polypropylene (pg. 8, lines 18-25; pg. 9, lines 5-15), and further including a urethane coating on a first side of the base film (pg. 8, lines 15-17; pg. 9, lines 1-4), with the coating having been applied to the base film between a machine direction orientation and a transverse direction orientation of a two-step tentering operation (pg. 3, lines 13-15; pg. 5, lines 22,23).

A tentering operation is well known in the field of forming biaxially oriented films. In accordance with this operation a polymeric material wherein the predominate polymer is polypropylene is extruded in the form of a sheet from a conventional extruder. The sheet is then

stretched in the machine direction to thereby orient the sheet in that direction. After the sheet has been stretched in the machine direction it is stretched in a transverse direction.

The polymeric base film with the predominate polymer being polypropylene, and with a urethane coating on one side provided between the machine direction and cross-machine direction stretching operations results in a film having enhanced ink adhesion properties making the film receptive to receiving and retaining a variety of inks, including solvent based gravure and flexographic ink, water based flexographic inks, lithographic inks and UV inks (pg. 3, lines 2-10).

As specified in the application, printed films of this invention, with the urethane coatings applied between the machine direction and cross-machine-direction steps, have improved water resistance (pg. 3, lines 9 and 10). That is, the printed samples of this invention, due to excellent ink adhesion, were able to pass abrasion resistance testing that included exposing the printed films to extreme moisture conditions in both ice chest aging (cold) and pasteurization aging (hot) processes (pg. 10, lines 1-7). The reference to improved water resistant properties of the films of this invention means that even after exposing the printed films to extreme moisture conditions in both ice chest and pasteurization tests the ink adhesion to the films was excellent, as evidenced by the ability of the inks printed on the films to pass abrasion resistance testing. When the same urethane coatings that passed ink adhesion testing in the films of this invention were applied to films off-line, after both machine direction and cross-machine-direction orientation, and then printed, they did not pass the ink adhesion tests that were passed by the films of this invention.

The invention described above is specified in claim 1.

In the preferred embodiment of the invention, the base film, wherein the predominant polymer is polypropylene, includes an anti-blocking agent, preferably up to 1% by weight of the film and more preferably up to about 0.5% by weight of the film. (pg. 3, lines 16-19)

In the preferred embodiments of the invention, the urethane coating comprises a waterborne urethane dispersion that can be blended, if desired, with waterborne acrylic dispersions. (pg. 6, lines 7-9; pg. 7, lines 23, 24) In certain embodiments, the urethane coating includes a cross-linking agent; preferably up to 1% of the dry weight of the coating. (pg. 10, lines 1 through 3) In a preferred embodiment of this invention the urethane coating comprises an antiblocking agent. (pg. 7, lines 24, 25; pg. 8, lines 4-6)

In the preferred embodiment, the surface of the base film provided with the urethane coating is surface treated to make it more receptive to receiving the coating. Most preferably the surface treatment is an oxidative treatment. (pg. 8, lines 18-20)

In the preferred embodiments, the opposed surface of the base film, that is, the surface opposed to the first surface that receives the urethane coating, also is surface treated, preferably by oxidative treatment, to make the second surface receptive to additives, such as adhesives. (pg. 8, lines 23,-25; pg. 9, lines 11-15)

In accordance with one embodiment of the invention, the polypropylene constituting the predominant polymer of the base film is a polypropylene homopolymer. (pg. 9, lines 9, 10)

In accordance with other aspects of the invention, the polypropylene constituting the predominant polymer is a copolymer of polypropylene. (pg. 7, lines 3,4; 9,10) Moreover, it is

within the scope of the invention to provide a predominant polymer of polypropylene employing a blend of both homopolymers and copolymers. (pg. 7, lines 4-6, 10-11)

In a preferred structure of this invention, the base film is co-extruded as a multi-layer structure including a core and at least one outer skin. (pg. 7, lines 7-9)

The in-line coating of the urethane-based material between the machine direction orientation and the transverse direction orientation steps has several advantages, including the reduction of blocking tendency, improvement in water resistance of printed samples and a reduction or elimination of the use of a cross-linking agent.(pg. 3, lines 1-10). As stated earlier, the reference to improved water resistant properties of the printed films of this invention means that even after exposing the printed films to extreme moisture conditions in both ice chest and pasteurization tests the ink adhesion to the films was excellent, as evidenced by the ability of the inks printed on the films to pass abrasion resistance testing.

Appellant has determined that in order to achieve the desired results in this invention, the urethane dispersions or waterborne, urethane dispersions blended with waterborne acrylic dispersions must be applied in line between a machine direction orientation and a transverse direction orientation of a two step tentering operation. In testing described in the second full paragraph on page 6 of the application, Appellants determined that formulations that successfully passed various ink adhesion tests when applied as in-line coatings in accordance with the present invention did not perform satisfactory when applied off-line after the machine direction and cross machine direction orientation steps.

Moreover as pointed out in the last paragraph on page 9 and the first paragraph on page 10 of the specification, the films of the present invention have been determined to have desirable water resistant properties (based on ice chest and pasteurization tests) using little (up to 1%) or no cross linking agent. That is, even after exposing the printed films of this invention to extreme moisture conditions in both ice chest and pasteurization tests the ink adhesion to the films was excellent, as evidenced by the ability of the printed films to pass abrasion resistance testing.

Moreover, as is noted in the first paragraph on page 10, the ability to use little or no cross linking agent was an unexpected result because, for example, the addition of a polyfunctional aziridine cross linking agent at less than 3% in a standard off-line coating process did not give the required water and temperature resistant properties to the printed samples, as determined by abrasion resistance testing of the printed samples after the samples were exposed to extreme cold (ice chest) and hot (pasteurization) tests.

Appellant has determined that the combination of the urethane coating composition and the processing technology, i.e., in-line coating between the machine direction and cross-machine direction orientation step, provides the unique ink adhesion properties achieved in this invention.

ISSUES PRESENTED FOR REVIEW

1. Whether the patents to Kinoshita et al. (U.S. Pat. No. 5,824,394) and Posey et al. (U.S. Pat. No. 4,525,419) are properly combinable in the manner suggested by the Examiner.
2. Whether the Examiner improperly used appellants' own invention as a template, or blueprint to construct the final rejection.

3. Whether the combination of the teachings in the Kinoshita et al. '394 patent and in the Posey et al. '419 patent renders obvious the subject matter specified in claims 1-24 appealed herein.

GROUPING OF CLAIMS

The Examiner rendered a single ground of rejection for claims 1-24, which are all of the claims being prosecuted in this application and are the claims being appealed herein. The claims of the appealed group do not stand or fall together.

ARGUMENTS

The sole rejection of claims 1-24 is "under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. (US Pat. No. 5,824,394) in view of Posey et al. (US Pat. No. 4,525,419)." Applicant submits that the two references relied upon in the rejection, taken as a whole, do not teach or suggest the claimed invention.

As a separate basis for reversing the Examiner, Appellant contends that the features disclosed in the Posey et al. '419 patent are not properly combinable with the features disclosed in the Kinoshita et al. '394 patent to meet the terms of Appellant's claimed invention.

Appellant's comments will first be directed to claim 1, the only independent claim under appeal.

Claim 1 is specifically directed to a printable, coated, biaxially oriented film including a polymeric base film in which the predominate polymer is polypropylene, and a urethane coating on a first side of the film, wherein the urethane coating is applied to the base film between a

machine direction orientation and a transverse direction orientation of a two-step tentering operation.

Biaxially oriented, polymeric base films wherein the predominant polymer is polypropylene are extremely well suited for packaging applications because they have good stiffness, strength, optical properties (low haze and high gloss) and moisture barrier properties. However, these films generally have a low surface energy and are not receptive to receiving printing inks without surface treatment, such as corona or flame treatment. There is a continuing desire to achieve improved printability of these polypropylene films. Therefore, it is extremely important to form these biaxially oriented polypropylene films so that they are highly receptive to printing inks.

Appellant has discovered that by first forming a polymeric base film with the predominant polymer being polypropylene, and thereafter applying a urethane coating on a first side between a machine direction and a transverse direction orientation step, a highly desirable, biaxially oriented film is achieved, having excellent ink adhesion as determined by abrasion resistance testing employing extreme moisture conditions, as described earlier herein.

In the Final Rejection, the Examiner stated his recognition that the teachings in the Kinoshita patent differed from the invention specified in claims 1-6, 8, 11-17 and 21-24 because Kinoshita did not teach that the base film should be predominantly polypropylene. In fact, the Examiner is correct, since Kinoshita is directed to a film that is entirely different from the films of the present invention. The teachings in Kinoshita relating to specific polyester films do not

relate in any way to the films of this invention, which, as claimed, are predominantly polypropylene.

To attempt to overcome the acknowledged deficiency in the Kinoshita patent, the Examiner relies upon the Posey '419 patent, which broadly suggests that the base film of the laminate disclosed therein could be an oriented polyester or polypropylene film, referring to column 3, lines 25-30. Based upon this teaching in Posey, the Examiner took the position that it would have been obvious to one of ordinary skill in the art to have employed the polypropylene film as taught by Posey as the base film in the Kinoshita structure in place of the Kinoshita polyester film. To attempt to justify the propriety of this substitution, the Examiner took the position that Posey teaches that a polypropylene film is an equivalent of a polyester-based film, and therefore to substitute one for the other in the Kinoshita structure would be obvious.

Appellant submits that the rejection by the Examiner should be reversed for several reasons:

1. First, there is absolutely no motivation for the combination proposed by the Examiner.
2. Second, there is absolutely no suggestion that a polypropylene film and a polyester-based film would be considered equivalent in the Kinoshita structure.
3. Third, the Posey et al. '419 patent actually teaches that a polyester-based film and a polypropylene film are not equivalent structures for all purposes, as will be explained in detail hereinafter. As such, there is no teaching in the Posey et al.

'419 patent that a polyester-based film and a polypropylene film would be equivalents for films of the type described and claimed by Appellant.

4. Fourth, each of the applied references actually teaches away from making the combination proposed by the Examiner, for the reasons which will be presented hereinafter. In fact, substituting a polypropylene film for the polyester films disclosed in Kinoshita would be at odds with the Kinoshita invention.

The Kinoshita et al. '394 invention is directed to a biaxially oriented laminated polyester film. Kinoshita et al. teach that a layer of an acrylic-based resin or a urethane-based resin can be provided on the surface of a polyester layer A of only a specified composition. There is absolutely no motivation or suggestion that a different polymer can be used in place of a polyester layer A. In fact, Kinoshita et al. specifically state that their invention resides in the use of the specifically disclosed polyester layer A for receiving either an acrylic-based resin or a urethane-based resin coating. In this regard, the Board's attention is directed to the paragraph beginning on line 16 of column 2 of the Kinoshita et al. patent, which reads as follows:

> "As a result of the present inventors' studies for overcoming the above problems, it has been found that by use of a polyester film having a specific construction, it is possible to remarkably improve adhesiveness of the polyester film layer to any kind of functional layer. On the basis of the finding, the present invention has been attained." (Emphasis added.)

The Kinoshita et al. invention as disclosed to a person skilled in the art is that the polyester film layer for receiving either an acrylic-based resin or a urethane-based resin must be a polyester film having the composition specified therein. Thus, the Kinoshita et al. '394 patent actually teaches away from replacing the disclosed polyester film with any other film, including a polypropylene based film, in the manner proposed by the Examiner. Such a substitution would be at odds with the invention described and claimed in Kinoshita et al. The whole thrust of the Kinoshita et al. '394 patent is that the polyester film layer specified and claimed therein must be employed in the combination, and, in fact, it is the use of this particular polyester film layer that provides the alleged enhanced result of improved adhesiveness to other functional layers.

Although the above-discussed teachings in the Kinoshita et al. '394 patent should put the obviousness issue to rest, even without considering the Examiner's position with respect to the teachings in the Posey '419 patent, Appellant will now point out what Posey et al. actually teaches to a person skilled in the art.

Specifically, the alleged inventive concept or feature in the Posey et al. '419 patent is the specific primer identified therein. Apparently, Posey et al. did not want to limit their invention to the use of only a single base film, in view of the fact that the inventive feature was not considered to be in the base film, but rather in the specific polyester primer coatings described and claimed therein.

The fact that the copolyester primer coatings constitute the inventive feature is specified throughout the Posey et al. patent. For example, Posey et al. state: "In the synthesis of the

copolyester primer coatings of this invention... ." (Column 5, lines 57,58) (Emphasis added); "The copolyester primer coatings of this invention exhibit excellent heat stability... ." (Column 6, lines 35, 36) (Emphasis added); "Plastic film primed with the copolyester composition of this invention has excellent utility as a film base... ." (Column 6, lines 50, 51) (Emphasis added). Moreover, although claim 1 in the Posey et al. '419 patent does not include a limitation relating to the polymer composition of the plastic film, it does specifically identify the composition of the "polyester primer coating" that forms the essence of the disclosed invention.

Very significantly, and contrary to the assertion of the Examiner, Posey et al. clearly teaches that a polypropylene film and a polyester film are not equivalent films for all purposes. In this regard, the Board's attention is directed to Example 28 and Table 2, appearing in columns 13 and 14 of the Posey et al. patent. In particular, note Table 2, which presents data relating to ink adhesion for four different ink types on various films, including polypropylene and polyester based films. The Control identified in Table 2 is the specifically identified film without the use of any primer. The reference to "Sample" refers to the films with the inventive "polyester primer coatings" thereon. As can been seen in the far right column of the Table, which presents data with respect to the use of a polyamide type ink, a polypropylene film without the primer had zero ink adhesion while a polyester film without the primer had 100% ink adhesion. This demonstrates that polypropylene and polyester are not equivalents with respect to ink adhesion. In fact, as explained below, Posey actually shows that even with the inventive co-polyester primer coating thereon polypropylene and polyester are not equivalent polymers for the base film.

Specifically, the Board's attention is directed to the data in Table 2 relating to the use of solvent flexo ink on polypropylene and polyester films. Although the Control for both films had zero ink adhesion, it should be noted that the ink adhesion properties of these two films were materially different when the inventive co-polyester primer coating was employed. Specifically, the ink adhesion on the polypropylene film coated with the co-polyester primer was 50% and the ink adhesion with the polyester film coated with the co-polyester primer coating was 100%. This difference in ink adhesion with the same primer also demonstrates that polypropylene and polyester are not equivalents for the stated use in the Posey invention.

Clearly there is no teaching that polypropylene and polyester are equivalent polymers for use in biaxially oriented film structures of the type specified in the appealed claims.

As an additional point, it should be noted that Example 28 is the only example in which a polypropylene film was employed. In that Example the coatings were added to the completely formed, biaxially-oriented film, offline. In other words, the product including a polypropylene base film was not made by applying the coatings online between a machine direction and transverse direction orientation step as is required in the present application. Thus, there is absolutely no teaching in Posey et al. that a polypropylene film can or should be provided with any coating between the machine direction and cross-machine direction stretching steps in a tenter operation to achieve superior results for any purpose, let alone to achieve superior ink adhesion results as is disclosed in the present application.

In all of the prior twenty-seven (27) examples in Posey et al. the film being coated was a polyester film that was coated online with various different polyester coatings.

Specifically, Examples 1-9 included various different co-polyester coatings within the scope of the invention, which were applied to a polyester film between the machine direction and transverse direction stretching operations.

Examples 10C-26C show samples wherein a polyester film was coated between the machine direction and transverse direction stretching operations with various coatings that were outside the scope of the invention.

Example 27 employed a co-polyester primer within the scope of the invention applied online to an amorphous polyester film prior to any stretching. Thereafter, the film was stretched transversely to form a monoaxially oriented film online.

In summary, Examples 1-27 employed only a polyester film, and it is only with the use of such a film that any coating was applied online.

Example 28, which is the only example relating to the use of other films, such as polypropylene, does not teach applying the co-polyester primer coating online between a machine direction and transverse direction orientation step. The co-polyester primer coating was applied to the film offline after the film had been biaxially oriented.

The data generated in Example 28, as shown in Table 2, shows that the important feature of the Posey et al. invention is the use of the specifically claimed polyester primer coatings. However, even with the use of the inventive primer the polymer composition of the film still had some effect on the percentage of ink retention, at least for some inks.

There is absolutely no suggestion or teaching in the Posey et al. '419 patent that a polypropylene film and a polyester film will behave the same way with the use of primers. In

fact, Table 2 demonstrates that with the use of a solvent flexo inks even the use of the inventive co-polyester primer coating did not result in the same level of adhesion on a polypropylene film and a polyester film.

Thus, in summary, the Posey et al., '419 patent does not establish that a polyester film and a polypropylene film are equivalent for all purposes, thereby refuting the Examiner's position that these films are equivalents.

What the Posey et al. '419 patent teaches a person skilled in the art is that a variety of different polymer films can be employed but only with a specifically disclosed co-polyester primer coating. Posey et al. also disclose that polypropylene films and polyester films are not equivalent for all purposes; their performance with respect to ink adhesion is directly related to the primer coating being employed. In fact, even with the same primer coating of the claimed invention, ink receptivity with the use of these two films can be different with the use of different inks. There is absolutely no suggestion that a variety of different base films could be used with any type of coating other than the specific polyester coating of the disclosed invention.

On the other hand, the Kinoshita et al.'394 patent, which indicates that a urethane-based resin or an acrylic-based resin can be used as a coating, is specifically limited to employing that coating on a polyester film layer having the specific composition identified therein. Kinoshita et al. actually teaches away from using any film other than the specified polyester film.

The only basis for combining the Kinoshita et al. and the Posey et al. patents in the manner suggested by the Examiner is to employ Applicants own invention as a bridging disclosure. This clearly is improper.

Claims 2-24 are either directly or indirectly dependent on Claim 1, and therefore are submitted to be patentable for the same reasons discussed above in connection with Claim 1.

Claim 8 is dependent upon Claim 1 and specifies that the urethane coating comprises a cross linking agent.

Claim 9 is dependent upon claim 8 and specifies that the crossed linking agent in the coating is present at up to 1% by dry weight of the coating.

Claim 10 is dependent on Claim 8 and specifies that the cross linking agent is polyfunctional aziridine cross linking agent at up to 1% by dry weight of the coating.

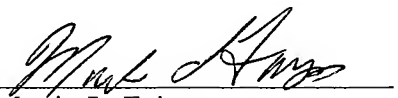
As is pointed out in the first full paragraph on page 10 of the specification, Appellant determined that achieving improved water resistance (i.e., excellent ink adhesion even after the films were exposed to severe moisture conditions in ice chest and pasteurization tests), using up to 1% of a cross linking agent; specifically polyfunctional aziridine, was unexpected. Specifically, in a standard coating process the addition of polyfunctional aziridine at less than 3% did not provide the required water and temperature resistance to achieve and maintain acceptable ink adhesion, as determined by abrasion resistant testing employing both ice chest and pasteurization aging processes. Thus, claims 9 and 10 describe additional patentable features of the present invention.

Based upon the above arguments, Appellant submits that the claims presented for consideration herein set forth patentably novel subject matter and accordingly Appellant respectively requests that the final rejection of the appealed claims be reversed.

Respectfully submitted,

CAESAR, RIVISE, BERNSTEIN,
COHEN & POKOTILOW, LTD.

September 25, 2006

By 

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CLAIMS APPENDIX

APPENDIX

Claim 1. A printable, coated, biaxially oriented film, comprising:

(a) a polymeric base film having a predominant polymer, and a first and a second side, said predominant polymer being polypropylene; and

(b) a urethane coating on said first side, said coating having been applied to said base film between a machine direction orientation and a transverse direction orientation of a two step tentering operation.

Claim 2. The film of claim 1, wherein the base film additionally comprises a base film antiblock agent.

Claim 3. The film of claim 2, wherein the base film antiblock agent is present at up to 1% by weight of the film.

Claim 4. The film of claim 2, wherein the base film antiblock agent is present at up to 0.5% by weight of the film.

Claim 5. The film of claim 2, wherein the base film antiblock agent is an antiblock agent selected from the group consisting of silica-based, silicone-based, and a blend of silica-based and silicone-based antiblock agents.

Claim 6. The film of claim 1, wherein the urethane coating comprises a waterborne urethane dispersion.

Claim 7. The film of claim 1, wherein the urethane coating comprises a waterborne urethane dispersion blended with waterborne acrylic dispersions.

Claim 8. The film of claim 1, wherein the urethane coating comprises a crosslinking agent.

Claim 9. The film of claim 8, wherein the crosslinking agent is present in the coating at up to 1% by dry weight.

Claim 10. The film of claim 8, wherein the crosslinking agent is polyfunctional aziridine crosslinking agent at up to 1% by dry weight of the coating.

Claim 11. The film of claim 1, wherein the urethane coating comprises a coating antiblock agent.

Claim 12. The film of claim 11, wherein the urethane coating comprises up to 1% coating antiblock agent based on dry component weight of the coating.

Claim 13. The film of claim 11, wherein the base film antiblock agent is an antiblock agent selected from the group consisting of silica-based, silicone-based, and a blend of silica-based and silicone- based antiblock agents.

Claim 14. The film of claim 1, including a surface treatment on the first side beneath the urethane coating.

Claim 15. The film of claim 14, wherein the surface treatment on the first side comprises an oxidative treatment.

Claim 16. The film of claim 1, including a surface treatment on the second side.

Claim 17. The film of claim 16, wherein the surface treatment on the second side comprises an oxidative treatment.

Claim 18. The film of claim 1, wherein the polypropylene is a polypropylene homopolymer.

Claim 19. The film of claim 1, wherein the polypropylene is a copolymer of propylene.

Claim 20. The film of claim 1, wherein the polypropylene is a blend of homopolymers and copolymers.

Claim 21. The film of claim 1, wherein the base film is a coextruded structure.

Claim 22. The film of claim 21, wherein the coextruded structure has at least three layers.

Claim 23. The film of claim 21, wherein the coextruded structure includes a core and at least one skin layer.

Claim 24. The film of claim 1, wherein the base film is an extruded film that has an additional layer added by extrusion coating.

Evidence Appendix

Not Applicable

Related Proceedings Appendix

Not Applicable